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Response of artificial human skin to irritants:
cytokine and prostaglandin release

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ABSTRACT

Cytokines have been implicated in aspects of vesicant injury/repair. This study describes responses of artificial human skin (Skin² and EpiDerm) to chloroethyl ethyl sulfide (CEES), defined by interleukin-1 α (IL-1 α), tumor necrosis factor- α (TNF- α) and prostaglandin E₂ (PGE₂) release. Skin² and EpiDerm in Millicells of 6 well Costar trays containing 1ml of assay media/well were exposed to CEES (2.0mg/L, flow rate 1L/min for 2hr) in humidified air. Control tissues were exposed without CEES. Millicells containing Skin² or EpiDerm (12/group) were transferred to fresh assay media and incubated for 22 hr. Tissues (6/group) were used for MTT tests. Media from each well were stored in liquid N₂. IL-1 α (RIA or ELISA), PGE₂ (RIA or EIA), and TNF- α (EIA) were measured in thawed specimens. CEES significantly increased release of IL-1 α (192pg/ml \pm 34.9, control 55pg/ml \pm 16.6) and PGE₂ (3,977pg/0.1ml \pm 1,197, control 2,541pg/0.1ml \pm 570) from Skin², but not TNF- α levels, with viability (MTT) 3%. Neither IL-1 α nor TNF- α were elevated by CEES-exposed EpiDerm, although PGE₂ was elevated (258pg/0.1ml \pm 71 vs 184 \pm 79), viability 46%. We conclude pro-inflammatory mediators, IL-1 α and PGE₂, could play significant roles in CEES injury and that either fibroblasts are critical to the process, or EpiDerm, which lacks fibroblasts, is somehow more resistant.

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